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NASA TECHNICAL MEMORANDUM

NASA TM X- 64739

1973 NASA MISSION MODEL


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*George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama*

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16. ABSTRACT The April 1973 NASA Mission Model and the NASA estimate of the April 1973 Non-NASA/Non-DoD Mission Model for calendar years 1973 through 1991 are presented along with summary Mission Model totals for NASA, Non-NASA/Non-DoD, and DoD for calendar years 1980 through 1991.			
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GLOSSARY

A-C	Designation for first three missions
Appl	Application
Astr	Astronomy
Autom.	Automated
Comm	Communications
Coop	Cooperative
D-E	Designation for fourth and fifth missions
DoD	Department of Defense
Encke	Comet
Environ	Environment
EOS	Earth Observation Satellite
ERTS	Earth Resources Technology Satellite
Follow-on	Refers to subsequent flights for more detailed investigations
GEOS	Geodetic Satellite
Geosyn	Geosynchronous orbit
Grav	Gravitational
Halo	Lunar orbiting communication satellite
Helio	Heliocentric
Helios	Solar mission
Hi	High
Interstel	Interstellar
IR	Infrared
Jup	Jupiter

Lab	Laboratory
LAGEOS	Laser Geodynamic Satellite
Max	Maximum, refers to maximum solar activity
Met	Meteorology
Mini	Small
Monit	Monitoring
N-P	Refers to mission number
Nav	Navigation
Nep	Neptune
Nimbus	Meteorology satellite
Obs	Observatory
Oper	Operational
OTDA	Office of Tracking and Data Acquisition
Perturb	Perturbation
PI	Planetary
R&D	Research and Development
Rel	Relativity
Revisits	Rendezvous with orbiting spacecraft for maintenance and data retrieval
S/C	Spacecraft
Sat	Satellite
Sat/Uranus	Saturn/Uranus
SEASAT	Seastate Satellite for ocean physics
SEOS	Synchronous Earth Observation Satellite
Sortie	Refers to payload carrier, Sortie Lab, Sortie Lab plus Pallet, or Pallet only

Syn	Geosynchronous orbit
Sys	System
Tech	Technology
Telesc	Telescope
Tiros	Meteorology satellite
Track	Tracking
U-Probe	Uranus probe
U.S.	United States
UV	Ultraviolet
Viking	Mars soft lander
“X”	Refers to unspecified comet mission
XUV	Extreme ultraviolet

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TECHNICAL MEMORANDUM X-64739

1973 NASA MISSION MODEL

INTRODUCTION

The April 1973 NASA Mission Model is presented along with the NASA estimate of the April 1973 Non-NASA/Non-DoD Mission Model. All space missions for calendar years 1973 through 1991 are included. This document is intended for NASA planning purposes only. Many of the missions included in this document are not approved programs.

This Mission Model is to be used as the baseline for payload-related studies. It assumes a level NASA budget (at approximately the 1973 NASA budget) and the availability of the NASA-developed Space Shuttle for operations beginning in late calendar year 1979. The data in this document will be used to develop detailed payload descriptions, launch vehicle traffic models, and costing analyses.

The Mission Model data in Tables 1 through 11 are broken into Automated (unmanned) and Sortie (manned or man-tended) categories. Table 12 summarizes all the Automated missions and Table 13 summarizes all the Sortie missions for calendar years 1980 through 1991. Table 14 presents a summary of all mission model totals including DoD for calendar years 1980 through 1991.

TABLE 1. ASTRONOMY

	CY	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	Total
<u>Automated Spacecraft</u>																					
Explorers		②	①	②	①	①	②	1	2	1	1	2	1	2	1	2	1	1	1	1	26
Orbiting Solar Obs. I			①																		1
Solar Max Satellite							1														7
High Energy Astr. Obs. A-C ^a					ⓧ	①	①		1*												3
<u>Large Observatories</u>																					
High Energy Astr. Obs. D+E																					2
Revisits												1	1	1			1	1	1	1	7
Large Space Telescope																					3
Revisits									1	1			1	1	1	1		1	1	1	9
Large Solar Obs.																					1
Revisits															1	1	1	1	1	1	6
Large Radio Obs.																					1
Revisits																1		1		1	3
Large Hi Energy Telesc. (X-Ray)																					1
Revisits																		1	1	1	4
Total Autom.		2	2	2	2	3	3	1	4	2	4	4	4	6	4	7	6	6	6	6	74
<u>Sortie Payloads</u>																					
(IR, UV, XUV, Telescopes and Sensors)									1	2	4	8	10	12	10	10	12	10	10	12	101

Notes:

a. In FY74 Budget Request

* Revisit or Retrieved with Shuttle

○ Approved and Ongoing

TABLE 2. SPACE PHYSICS

	CY	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	Total
<u>Automated Spacecraft</u>																					
Explorers		②	①	②	①	②	①	2	1	2	1	1	2	1	1	1	2	2	2	2	29
Grav. & Rel. Sat.									1			1			1				1		4
Environ. Perturb. Sat.										1			1			1			1		4
Helio. & Interstel. S/C																	1				1
<u>Large Observatories</u>																					
Cosmic-Ray Laboratory Revisits																			1	1	4
Total Autom.		2	1	2	1	2	1	2	2	3	1	2	3	1	2	3	4	3	4	4	43
<u>Sortie Payloads</u>																					
(High Energy & Aeronomy)									1	2	2	3	8	8	8	8	8	8	8	8	72

Note:

○ Approved and Ongoing

TABLE 3. EARTH OBSERVATIONS

	CY	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	Total
<u>Automated Spacecraft</u>																					
ERTS					①																1
NIMBUS			①			①															2
EOS, R&D							1	1	1												2
SEOS, R&D										1		1									2
Small Appl. Tech. Sat.						1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	18
TIROS N-P					①						1					1					3
Syn. Met. Sat.		①	①				1						1								4
EOS										1*	2	1	2	1	2	1	2	1	2	1	16
SEOS																2		2		2	6
Total Autom.		1	2		1	3	3	2	3	4	4	3	4	2	3	5	3	4	3	4	54
<u>Sortie Payloads</u>																					
(Weather Simulation Lab., Sensor R&D)									2	2	2	2	2	2	2	2	2	2	2	2	24

Notes:

* Non-Polar Demonstration

○ Approved and Ongoing

TABLE 4. MATERIALS SCIENCE

	CY	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	Total
<u>Sortie Payloads</u> (Crystal Growth, Biological Separation, Metallurgy)									1	2	4	4	4	4	4	4	4	4	4	4	43

TABLE 5. EARTH AND OCEAN PHYSICS

	CY	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	Total
<u>Automated Spacecraft</u>																					
GEOS			①																		1
LAGEOS					①																1
SEASAT - A						1															1
GEOPAUSE								1			1										2
Grav. Gradiometer									1												1
Mini-LAGEOS ^a									1					1							2
GRAVSAT								1													1
Magnetometer Sat.										3					3				3		9
Magnetic Monitor Sat.										1					1				1		3
SEASAT - B											1										1
Total Autom.			1		1	1		2	2	4	2			1	4				4		22
<u>Sortie Payloads</u> (Earth and Ocean Dynamics Experiments)									1	1	1	1	1	1	1	1	1	1	1	1	12

Notes: a. Six Subsattellites Deployed from Each Spacecraft

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TABLE 6. COMMUNICATIONS AND NAVIGATION

	CY	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	Total
<u>Automated Spacecraft</u>																					
Applic. Tech. Sat.			①																		1
Coop. Applic. Sat.				①																	1
OTDA - Track. & Data Relay Sat.							3				3										6
Total		①	1	1	0	0	3	0	0	0	0	3	0	0	0	0	0	0	0	0	8
<u>Sortie Payloads</u> (Antenna Configurations Laser Technology, Traffic Management Techniques)										1	1	1	1	1	1	1	1	1	1	1	11

Note: ○ Approved and Ongoing

TABLE 7. LIFE SCIENCES

	CY	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	Total
<u>Automated Spacecraft</u>																					
Bioresearch Module					1		1	1	2												4
Total Autom.					1		1		2												4
<u>Sortie Payloads</u> (Bio-Engineering, Space Medicine, Bio-Research, Space Systems Research)																					28
									1	1	1	1	2	2	2	2	4	4	4	4	28

TABLE 8. SPACE TECHNOLOGY

	CY	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	Total
<u>Automated Spacecraft</u>																					
Long Duration Exposure Mod.									1	1	1	1	1	1	1	1	1	1	1	1	6
Total Autom.									1	1	1	1	1	1	1	1	1	1	1	1	6
<u>Sortie Payloads</u>																					
(Advanced Technology Lab, Fluid Physics, Gas Chemistry, Contamination Monitoring)									2	4	4	4	4	4	4	4	4	4	4	4	46

TABLE 9. LUNAR EXPLORATION

	CY	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	Total
<u>Automated Spacecraft</u>																					
Lunar Orbiter													1		1						2
Lunar Rover																1	1				2
Lunar Halo																		1			1
Lunar Sample Return																			1	1	2
Total													1		1	1	1	1	1	1	7

TABLE 10. PLANETARY EXPLORATION

	CY	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	Total
<u>Approved Programs</u>																					
Mariner Venus/Mercury		①																			1
Pioneer Jupiter Flyby		①																			1
Helios			①		①																2
Viking 75				②																	2
Mariner Jup/Sat 77						②															2
<u>Inner Planets</u>																					
Viking Orbiter/Lander								1													1
Surface Sample Return													1								1
Satellite Sample Return																		1	1		2
Venus Pioneer							2														2
Inner Pl. Follow-On									1		2	1			1						5
Venus Radar Mapper												2									2
Venus Buoyant Station													2								2
Mercury Orbiter																2					2
Venus Large Lander																	2				2
<u>Outer Planets</u>																					
Mariner Jup/Uranus Flyby							2														2
Pioneer Saturn Probe							1														1
Pioneer Sat/Uranus Flyby (U Probe)									2												2
Mariner Jupiter Orbiter										1	1										2
Pioneer Jupiter Probe													2								2
Mariner Saturn Orbiter														2							2
Mariner Uranus/Nep Flyby															2						2
Jupiter Sat. Orb/Lander																		1	1		2
<u>Comets & Asteroids</u>																					
Comet "X" Slow Flyby									1												1
Encke Rendezvous											2										2
Halley Flyby														1							1
Asteroid Rendezvous															2						2
Total		2	1	2	1	2	2	4	4	3	3	3	3	5	5	2	0	2	2	2	48

Note: ○ Approved and Ongoing

TABLE 11. NASA ESTIMATED NON-NASA/NON-DOD MISSION MODEL

	CY	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	Total
<u>Comm/Nav</u>																					
Intelsat		3	1	2	1	1	1	2	3			2	3	2	2			2	3	2	30
U.S. Domestic			5	5	1	1	1	1	1	2	2	1	1	1	2	2	3	2	2	1	34
Disaster Warning									1	1				1					1		4
Traffic Management					2	1	3	1	2	2	1	1	1		1		1		1		17
Foreign Comm.		2		1		1	1		1	2	2	1	2	2	1	2	2	2	2	2	26
Communication R&D				1		1	1		1	2	2	1	2	2	1	2	2	2	2	2	24
Prototype Operational									1	1	1	1		1		1	1		1	1	9
<u>Earth Observations</u>																					
Tiros Operational Sat.		1	1	1	1	1	1	1		1	1	1		1		1		1		1	14
Environ. Monitoring Sat.									1	1	1			1	1	1	1		1	1	9
Foreign Syn. Met. Sat.							2			1					1			1		1	6
Geosyn. Oper. Met. Sat.								1		1		1		1		1		1		1	7
Earth Resources																					
Low Earth Obs.									1	1	1	1	1	1	1	1	1	1	1	1	12
Geosynchronous																2		2		2	6
<u>Earth and Ocean Physics</u>																					
Global Earth & Ocean Monit. Sys.															3		3		3		9
Total Autom.		6	7	10	5	6	10	6	12	15	11	10	10	13	13	13	14	14	17	15	207
<u>Sortie Payloads</u>																					
Space Manufacturing														1	2	1	2	1	2	1	10
Foreign Science									1	1	2		2	2	2	2	2	2	2	2	20

TABLE 12. 1980-1991 PAYLOAD SCHEDULE SUMMARY
AUTOMATED SPACECRAFT

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Total
<u>NASA</u>													
Astronomy	4	2	4	4	4	6	4	7	6	6	6	6	59
Space Physics	2	3	1	2	3	1	2	3	4	3	4	4	32
Earth Observations	3	4	4	3	4	2	3	5	3	4	3	4	42
Material Science	0	0	0	0	0	0	0	0	0	0	0	0	0
Earth and Ocean Physics	2	4	2	0	0	1	4	0	0	0	4	0	17
Communications/Navigation	0	0	0	3	0	0	0	0	0	0	0	0	3
Life Sciences	2	0	0	0	0	0	0	0	0	0	0	0	2
Space Technology	1	0	1	0	1	0	1	0	1	0	1	0	6
Lunar	0	0	0	0	1	0	1	1	1	1	1	1	7
Planetary	4	3	3	3	3	5	5	2	0	2	2	2	34
Total	18	13	15	16	15	17	19	19	14	17	20	18	202
<u>Non-NASA/Non-DOD</u>													
Communications/Navigation	10	10	8	7	9	9	7	7	9	8	12	8	104
Earth Observations	2	5	3	3	1	4	3	6	2	6	2	7	44
Earth and Ocean Physics	0	0	0	0	0	0	3	0	3	0	3	0	9
Total	12	15	11	10	10	13	13	13	14	14	17	15	157
<u>DoD</u>	34	18	21	32	28	25	23	25	25	25	26	22	304
Grand Total	66	47	45	56	54	58	55	57	53	56	63	55	663

TABLE 13. 1980-1991 PAYLOAD SCHEDULE SUMMARY
SORTIE PAYLOADS

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Total
<u>NASA</u>													
Astronomy	1	2	4	8	10	12	10	10	12	10	10	12	101
Space Physics	1	2	2	3	8	8	8	8	8	8	8	8	72
Earth Observations	2	2	2	2	2	2	2	2	2	2	2	2	24
Material Science	1	2	4	4	4	4	4	4	4	4	4	4	43
Earth and Ocean Physics	1	1	1	1	1	1	1	1	1	1	1	1	12
Communication & Navigation	0	1	1	1	1	1	1	1	1	1	1	1	11
Life Science	1	1	1	1	2	2	2	2	4	4	4	4	28
Space Technology	1	4	4	4	4	4	4	4	4	4	4	4	46
Total	9	15	19	24	32	34	32	32	36	34	34	36	337
<u>Non/NASA-Non/DoD</u>													
Space Manufacturing	0	0	0	0	0	1	2	1	2	1	2	1	10
Foreign Astronomy/Space Physics	0	1	1	2	2	2	2	2	2	2	2	2	20
Total	0	1	1	2	2	3	4	3	4	3	4	3	30
Grand Total	9	16	20	26	34	37	36	35	40	37	38	39	367

TABLE 14. 1980-1991 TOTAL PAYLOAD SCHEDULE SUMMARY

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Total
<u>NASA</u>													
Automated	18	13	15	16	15	17	19	19	14	17	20	18	202
Sortie	9	15	19	24	32	34	32	32	36	34	34	36	337
Total	27	28	34	40	47	51	51	51	50	51	54	54	539
<u>Non-NASA/Non-DoD</u>													
Automated	12	15	11	10	10	13	13	13	14	14	17	15	157
Sortie	0	1	1	2	2	3	4	3	4	3	4	3	30
Total	12	16	12	12	12	16	17	16	18	17	21	18	187
<u>DoD</u>	34	18	21	32	28	25	23	25	25	25	26	22	304
Grand Total	75	63	65	82	88	95	91	92	93	93	101	94	1030

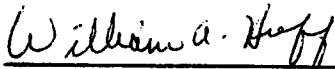
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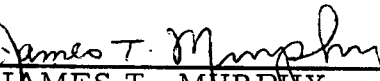
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WILLIAM A. HUFF

Manager, Shuttle Utilization Planning Office
Program Development



JAMES T. MURPHY

Director, Program Development